

REMARKS

Claims 1-32 are pending. By this Amendment, a typographical error is corrected in the specification. No new matter is added by the above amendment.

Claims 1-32 stand rejected under 35 U.S.C. §102(e) over U.S. Patent No. 6,563,573 to Morohoshi et al. This rejection is respectfully traversed.

Applicant respectfully submits that Morohoshi et al. does not disclose or suggest the combinations of features recited in the independent claims (claims 1, 8, 16, 23, 31 and 32) of this application. In addition, although Morohoshi et al. acknowledges that wafer-induced-shift (WIS) exists, Morohoshi et al. is only concerned with evaluating the imaging performance of the imaging optical system (that measures overlay accuracy) so as to determine and remove as much as possible the tool-induced-shift (TIS) caused by that imaging optical system. Morohoshi et al. does not disclose or suggest the combinations of features recited in Applicant's independent claims.

Morohoshi et al. recognizes that WIS can exist, asserts that there is a TIS-WIS interaction, and then seeks to remove TIS as much as possible by adjusting the optical system to prevent such a TIS-WIS interaction. See, for example, col. 2, lines 22-32, col. 5, lines 37-41 and col. 7, lines 23-25. As part of its procedure, Morohoshi et al. determines TIS at different focus positions. See col. 5, line 61 - col. 6, line 23. Morohoshi et al. measures the positional relationship between two marks at one focus position (col. 6, lines 49-51), and then after changing the focus position, again measures the positional relationship between those two marks (col. 7, lines 15-19). However, Morohoshi et al. does not disclose or suggest the combinations of features recited in Applicant's independent claims, which enable the output of information from which a user can determine whether a substrate suffers from WIS.

Regarding independent claims 1 and 16, Morohoshi et al. does not disclose or suggest calculating a relationship between changes in overlay deviation values and changes in focus

position of a substrate for a plurality of sets of first and second marks. While Morohoshi et al. measures the positional relationship between two marks and determines TIS at two different focus positions, Morohoshi et al. does not calculate a relationship between changes in overlay deviation values and changes in focus position of the substrate as recited in independent claims 1 and 16. Morohoshi et al. also does not disclose or suggest providing an output from which a user can determine whether the substrate suffers from WIS.

Independent claims 8 and 23 are patentable for at least the same reasons set forth above with respect to independent claims 1 and 16. That is, Morohoshi et al. does not disclose or suggest calculating a relationship between changes in overlay deviation values and changes in focus position based upon determined first and second overlay deviation values and first and second focus positions, and Morohoshi et al. does not disclose or suggest providing an output from which a user can determine whether a substrate suffers from WIS. Morohoshi et al. does not disclose or suggest determining first and second overlay deviation values, respectively determined based upon first and second positional deviation values and first and second TIS error values, as recited in claims 8 and 23.

Regarding independent claim 31, Morohoshi et al. does not disclose or suggest an apparatus that calculates a vector-trend illustrating a relationship between changes in overlay deviation values and changes in focus position of a substrate for a plurality of sets of first and second marks that are provided on the substrate.

Regarding independent claim 32, Morohoshi et al. does not disclose or suggest calculating first and second relationships between changes in overlay deviation values and changes in focus position of first and second substrates, and then determining a shift in WIS by comparing the first and second relationships. Morohoshi et al. provides no disclosure regarding a comparison of relationships between first and second substrates.

In summary, while Morohoshi et al. may determine TIS at two different focus positions, Morohoshi et al. does not disclose or suggest the specific combinations of features recited in the independent claims of this application. Accordingly, the independent claims along with their dependent claims are patentable over Morohoshi et al. Morohoshi et al. also does not disclose the features of the dependent claims of this application. For example, Morohoshi et al. does not disclose or suggest determining or displaying the first and second vector-maps as recited in dependent claims 5 and 20.

Withdrawal of the rejection is requested.

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further would be desirable to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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MAC/ccs

Date: May 9, 2006

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